A CAHNERS PUBLICATION 144 TOTAL PAGES INTERNATIONAL EDITION/APRIL 1, 1990

SPECIAL REPORT: IS BUDGETS IN RECOVERY!

DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

SYSTEMS & STRATEGIES FOR THE '90S:

The New Agenda for OPEN SYSTEMS

Users Say UNIX Isn't Enough Now They Want Standards at Every IS Level

Also in This Issue:

X-Terminals: The Latest Desktop Contender

A New Vision of Quality Control

A Broader View of Wide Area Networking

Measuring IS for Business Value

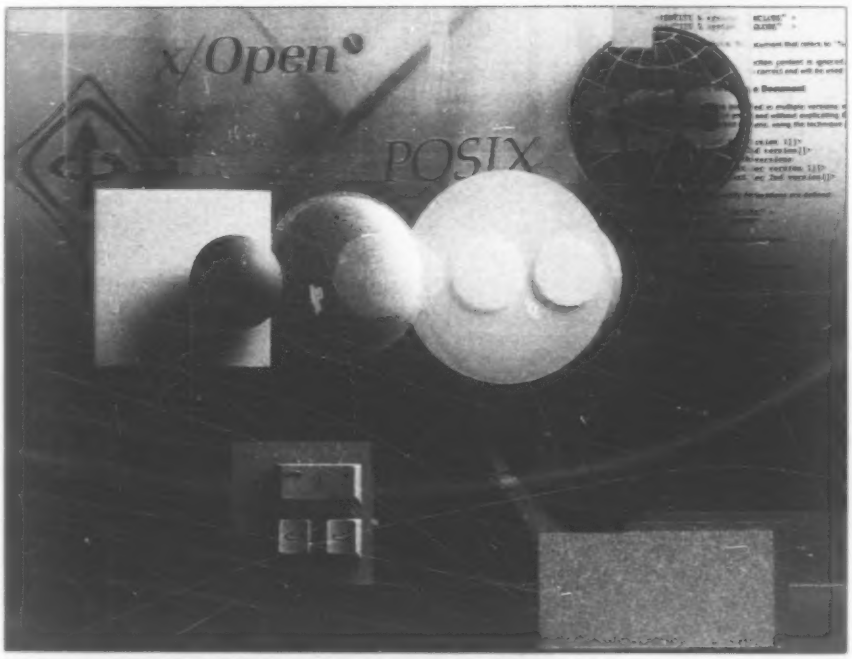
VOLUME 36
NUMBER 7

APRIL 1
1990

DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

COVER STORY



With a myriad of wishes unfulfilled, users look to life beyond UNIX.

The New Agenda for Open Systems 22

BY JEFF MOAD For most IS organizations, UNIX is no longer enough to carry the open systems movement. Now, standard data definitions, databases, interfaces and protocols are the critical elements necessary for the movement to succeed.

SYSTEMS STRATEGIES

SPECIAL REPORT

Recovery! 34

BY RALPH CARLYLE Users' information budgets are surging. An almost 6% increase in IS spending this year could be followed by an even bigger gain in 1991.

Spending on midrange systems is expected to dip, concurs Norbert Connors of U.S. Steel, who has just junked all his minis.

INSIGHTS ON DISTRIBUTED COMPUTING

We could have gone with workstations for our developers, but we decided it was more cost effective to go with X-terminals.

Richard VanderDrift
Oracle Corp.
PAGE 63

We may not be buying the latest and the greatest, but we will certainly be putting it to work better.

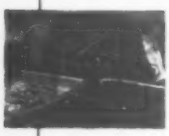
Harlan Neuville
General Motors Corp.
PAGE 70

As we thought about the network, it soon became apparent that we could interconnect the entire company, not just these design centers.

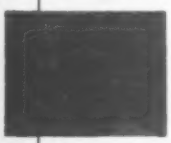
Roy Davis
Hughes Aircraft Co.
PAGE 83

DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE



Expert systems allow Mrs. Fields to capture her marketing techniques from chips to nuts.



Shearson's Hopfer looks to groupware to keep his shop in order.

TI's Lamkin uses vision systems to keep an eye on the whole line.

SOFTWARE

ARTIFICIAL INTELLIGENCE

Experts at Retail 53

BY HARVEY P. NEWQUIST III Expert systems technology once failed to attract widespread IS attention because of missing links to existing systems. With the connections now falling into place, practically any business can apply AI—even retail cookie stores.

DISTRIBUTED COMPUTING

Shearson's Image Of Groupware 61

BY ESTHER DYSON The New York City investment house is turning to PC-based electronic imaging not only to contain an explosion of paper in its back office but, eventually, to improve the way its professionals work.

SYSTEMS

TERMINALS

The Latest Desktop Contender 63

BY JOHN McMULLEN Barely visible last year, new X-terminal products are suddenly making a strong push for the desktop. But whether this intriguing technology stands much chance against personal computers remains to be seen.

MANUFACTURING

A New Vision of Quality Control 70

BY BOB FRANCIS U.S. companies' use of machine vision systems is evolving. The trend is to monitor the efficiency of the manufacturing process rather than to spot product defects.

DECISION SUPPORT

The People Factor In EIS Success 73

BY DAVID ARMSTRONG In part II of this executive information system saga, a member of the implementation team at the North American Aircraft Division of Rockwell pinpoints the people who can make an EIS program succeed or fail.

COMMUNICATIONS

NETWORKING

A Broader View Of Networking 83

BY TOM McCUSKER Despite all the challenges within Hughes Aircraft's decentralized, entrepreneurial environment, the IS staff implemented an Ethernet network for engineering which evolved into a corporate backbone.

Hughes Aircraft started out networking only its design centers, but eventually the entire company got involved.

MANAGEMENT

FINANCE

Measuring IS For Business Value 89

BY BILL HENRY Costing schemes based on key business indicators and developed with management and user participation can help companies hone their competitive stance. Chargeback should not be the sole goal.

ORGANIZATION

Organizing for Future Technologies 93

BY ROGER E. WASSON Information Systems should follow the example set by the business side of a company—with one unit handling current operations and another tending to future technology.

IMPACT '93

INTERNATIONAL

EUROPE

Borderless Banking Draws IS Interest

BY LINDA RUNYAN Financial firms are mounting Continental computer campaigns in order to reap the benefits of an economically united Europe. Here's a look at the IS plans of four such firms.

Special supplement, not included in all issues. 100-1

DEPARTMENTS

Inside DATAMATION	8	New Products	101	Career Opportunities	111
Letters and Access	12	Information Economics	108	Company Index	116
Look Ahead	17	Planner	110	Ad Index	116

Defining the Debate on Open Systems

A couple of weeks ago, I received a telephone call from our senior bureau manager in Los Angeles, Tom McCusker. Tom has covered the information-processing industry for 20 years for DATAMATION and has written just about every type of story on just about every conceivable topic. One of Tom's great strengths has been the freshness he brings to each new assignment. But on that day, there was an unusual excitement in his voice.

Tom was starting work on a new series for DATAMATION, which begins in this issue, on open systems. He had lined up some interviews for his part in the series and was starting to formulate some questions to ask the IS managers and supplier company executives he would interview. At that point, however, he stopped. He had a gnawing feeling that something didn't add up.

Photograph by David Bradley

THE NEW AGENDA for open systems is being written by users

"You know, Dave, I've been writing about open systems for the past few years, and I thought I understood the subject," he said. "But, as I started getting into our new series, I realized that I wasn't quite sure how to define open systems. Something's changed." Tom, I said in reply, sit back and relax. You've got just about everything you need, but one thing . . .

That one thing is our cover story this issue. Written by Jeff Moad, our senior writer in San Francisco, the story is a groundbreaking article on how IS managers and executives are redefining the open systems movement in terms of their own needs. No longer content with framing open systems simply around the UNIX operating systems, IS executives are calling for standards and interoperability across a wide variety of data, database, interface and communications definitions. These IS men and women accept UNIX. What they're now focused on is the infrastructure that will make the open systems concept—with its attendant benefits of interoperability, scalability and portability—a reality.

It's a clear message, sent honestly and openly, to anyone committed to open systems. When I told Tom what Jeff had discovered, I sensed an even greater excitement in his voice. "This will help me a great deal," he said. "I'm off and running."

Part 2 of our series on open systems, appearing next issue, will focus on what one organization is doing with open systems on an enterprisewide basis. Our Dallas-based bureau manager, Bob Francis, will be writing that one. Part 3, by Tom and senior writer Ralph Carlyle, will key in on how independent business units are implementing open systems. Part 4 will examine how supplier organizations plan to differentiate their product offerings in the age of open systems and, finally, in our June 1 issue, we will host a question and answer debate with proponents and skeptics of the open systems movement.

All in all, this series should be a keepsake. It will be one to which you will be referring for a long time.

David R. Brousell, Executive Editor

IN MEMORIAM

Edith D. Myers, a reporter and writer at DATAMATION magazine from 1970 to 1987, died March 9 from cancer. She was 59 years old and lived in Hollywood, Calif. Edith joined DATAMATION when the magazine was headquartered in Los Angeles, and wrote on a broad variety of topics during her 17 years with the publication. She retired in 1987, but continued to write about the industry. Edith is survived by three sons, Bruce, David and Eric, and two grandchildren.

EDITH D. MYERS

DATAMATION

Editor-in-Chief Tim Mead
Executive Editor David R. Brousell
Managing Editor Steve Paul
Senior Editor Linda Runyan
Senior Writers Ralph Carlyle, Jeff Moad
International Editor Marsha Johnston
Section Editor Paul Pinella
Production Editor C.J. Korisky
Assistant Production Editor Ellen Greenblatt
Copy Chief Andrea Ovans
Copy Editor Chris Stabi
Senior Art Director Chris Lewis
Associate Art Director William Reilly
Staff Artist David Gordon
Editorial Secretary Susan Mael

Bureau Managers
Boston Chris Sivula
Dallas Robert Francis
Los Angeles Tom McCusker
New York Parker Hodges
San Francisco Jeff Moad
San Jose Susan Kerr

Associate Editor/San Jose John McMullen
Assistant Editor/New Products Mike Ricciuti

Foreign Correspondents
Eastern Europe David Hebditch (Leeds)
France James Etheridge (Paris)
W. Germany Peggy Trautman (Bonn)
Spain Enrique San Juan (Barcelona)

Contributing Editors Leila Davis, Joseph Kelly, Fred Lamond, Kurt Rothschild, David Stamps

Advisory Board Joseph Ferreira, John Imlay, Angeline Pantages, Russell Pipe, Carl Reynolds

Publisher/Vice President Donald E. Fagan
Associate Publisher William Segallis
Marketing Com. Director Kathy Doyle
Production Supervisor Jim Fuss
Production Manager Laurie Poth
Research Manager Brandi Brito
Economics Editor Madeline Franchi
Director of Production John Sanders
Director of Art Department Joan Kelly
Circulation Manager Roxanne Wilson

EDITORIAL OFFICES
Headquarters: 275 Washington St., Newton, MA 02158. (617) 964-3030; telex 127703; fax (617) 558-4506. **New York:** 249 W. 17 St., New York, NY 10011 (212) 463-6524. **Washington, D.C.:** 4451 Albemarle St. NW, Washington, DC 20016 (202) 966-7100. **Central:** 9330 LBJ Freeway, Suite 1060, Dallas, TX 75243 (214) 644-3683. **Western:** 12233 W. Olympic, Los Angeles, CA 90064 (213) 826-5818; 582 Market St., Suite 1007, San Francisco, CA 94104 (415) 981-2695; 3031 Tisch Way, Suite 100, San Jose, CA 95128 (408) 243-8838. **International:** 27 Paul St., London EC2A 4JU, England (44-1) 628-7030; telex 914911.

DATAMATION® (ISSN 0011-6963) Magazine is issued twice monthly on the 1st and 15th of every month by the Cahners Publishing Company, a Division of Reed Publishing USA, 275 Washington St., Newton, MA 02158. Terrence M. McDermott, President; Frank J. Sibley, Senior Vice President/GM, Boston Division; Jerry D. Neth, Senior Vice President/Publishing Operations; J.J. Walsh, Senior Vice President/Finance; Thomas J. Dellamaria, Senior Vice President/Production and Manufacturing; Ralph Knupp, Vice President/Human Resources. Editorial and advertising offices: 275 Washington St., Newton, MA 02158. Published at Woodstock, IL. Annual subscription rates: U.S. and possessions: $69; Canada: $98; Japan, Australia, New Zealand: $180 air freight; $290 air mail; Europe $157 air freight; $250 air mail. All other nations: $157 surface; $250 air mail. Reduced rate for U.S. public and school libraries: $47. Single copy: $10 in U.S. Sole agent for subscriptions in Japan is Maruzen Co. Ltd., 3-10 Nihonbashi, 2-Chome, Chuo-ku, Tokyo 103 J; sole agent for all other foreign subscriptions is J.B. Tatsart Ltd., 154A Greenford Rd., Harrow, Middlesex HA13QT England (44-1) 422-8295 or 422-2456. No subscription agency is authorized by us to solicit or take orders for subscriptions. Circulation records are maintained at 44 Cook St., Denver, CO 80206. Phone (303) 388-4511. Second-class postage paid at Denver, CO 80206 and at additional mailing office. DATAMATION® copyright 1990 by Reed Publishing USA. Ronald G. Segel, Chairman and Chief Executive Officer; Robert L. Krakoff, President and Chief Operating Officer; William M. Platt, Senior Vice President. Reprints of articles are available; contact Frank Pruzina (312) 635-8800. Microfilm copies of DATAMATION® may be obtained from University Microfilms, a Xerox Company, 300 N. Zeeb Rd., Ann Arbor, MI 48106. Printed by Grafiek Press Inc. **All inquiries and requests for change of address should be accompanied by mailing label from latest issue of magazine.** Allow two months for change to be made. POSTMASTER: send address changes to DATAMATION®, 44 Cook St., Denver, CO 80206.

BETHLEHEM STEEL'S FUGERE estimates his IS budget will rise 5 to 6% in 1990 [illegible] labor costs and new software.

Photograph by Picture Group, Inc.

SPECIAL REPORT
ECONOMICS

98 RESEARCH

RECOVERY!

Users' information budgets are surging. An almost 6% increase in IS spending this year could be followed by an even bigger gain in 1991.

BY RALPH CARLYLE

The key to understanding IS budgets in the 1980s was the cycle of three: boom, bust and recovery. A year of expansion would be followed immediately by a year of contraction and then by a neutral year. The same key may unlock some of the mystery shrouding the industry as it enters the 1990s. In this, the first year of the new decade, the cycle seems to be on course: the IS budgets of major U.S. users are recovering—to the tune of nearly 6% increases in outlays for personnel, products and services.

This recovery, if left unscathed by world political and economic events, would be the last year of the second such cycle DATAMATION has observed since 1985, when the magazine began exhaustive measurements of IS spending patterns in the United States. More important, the recovery could presage a boom in technology investments planned by U.S. corporations and agencies for 1991.

There have been no back-to-back boom years or consecutive years of slumping fortunes in the six IS spending surveys conducted by DATAMATION. In 1985, respondents to our survey projected a 7.4% increase (boom) in IS outlays. In its wake came the 1986 bust of 4.2% and a recovering 5.1% in 1987. The cycle began once more with the 1988 high of 7.8% and last year's slump of 4.4%.

Respondents this year figure on 5.9% increases in their overall 1990 IS budgets. They expect to invest almost as much of their resources in personnel (41.3%), technologies (40.7%), overhead (10.1%) and outside services (7.9%) as they did in 1989, with slight variations.

If the pattern for total IS spending holds true, we can expect an almost 8% expansion in the budget next year, followed by relative slump, recovery and so on. But how, the wary IS executive might ask, can there be such a predictable rhythm in such an uncertain world?

Getting a Fix on Variable Costs

One answer lies in the ratio of fixed to variable costs present in all IS budgets. Of the four main components of the budget: personnel, technology investments, overhead and outside services, the first three have proved to be relatively fixed and

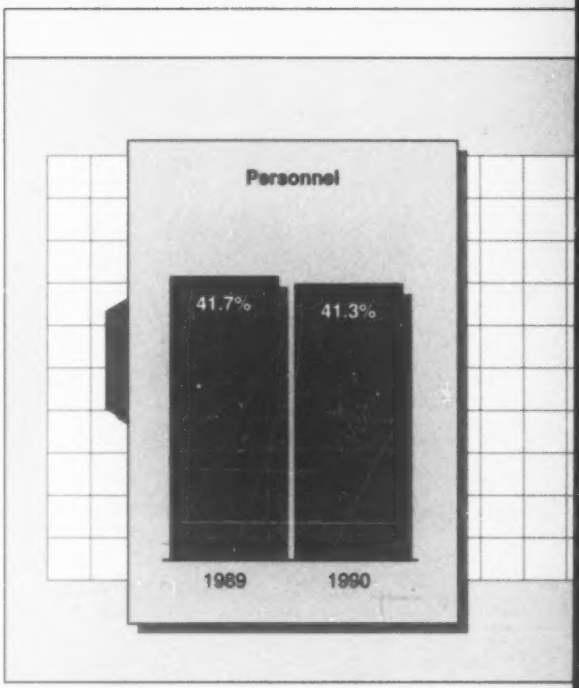
predictable—with the exception of software pricing. And when these first three components have not been predictable, executives controlling the budget have endeavored to make them so.

Take, for example, the traditional home of the IS department: the data center. Since 80% of data center costs are relatively fixed (people, overhead, capital equipment etc.), and since a boost in transaction volume results in scale-related cost reductions, the sensible course is to reduce the number of dispersed data centers. The result is to create fewer but larger centers. Companies are now doing this with increased frequency. (For more on such consolidation see the next issue of DATAMATION.) Data center consolidation reduces the fixed overhead and people costs, making the remainder more manageable and predictable. At the same time, such consolidation creates economies of scale that can result in further cost reductions.

Vendors have also contributed to a more predictable budget. IBM has settled into a yearly pattern of offering 25% more mainframe hardware throughput for the same price. A predictable decline in hardware prices is a feature of other machine classes across the industry as well, although the advent of reduced instruction set computing (RISC) processors could wreak havoc with this model.

Personnel costs typically consume 40% to 50% of a user's total IS budget. It's equally certain that hardware/software/communications purchases will consume 35% to 45% of the total budget. Where a company fits in the spectrum depends on whether it is in the public, manufacturing or services sector.

George T. Fugere, vice president of information services at Bethlehem Steel Corp. in Bethlehem, Pa., estimates that his 1990 IS budget ratio of fixed to variable costs is 75:25%. The process-manufacturing industries have traditionally typified the yearly averages in DATAMATION's cycle of three.



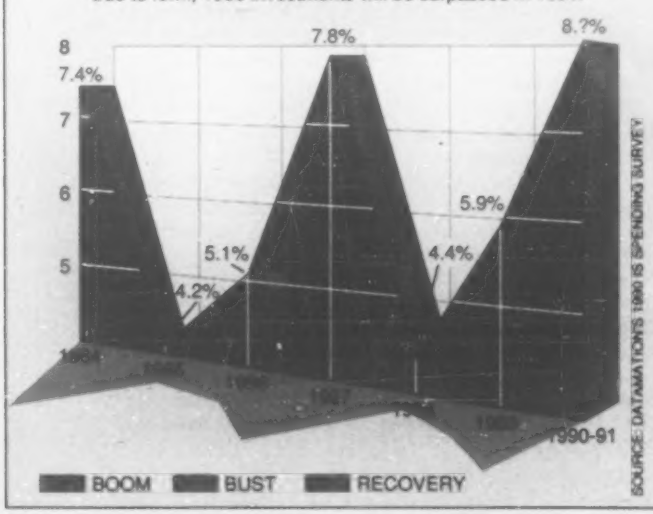
The variable aspect of the steel maker's IS budget depends entirely on how much systems development work the department must do in any particular year. Because demand from clients will be heavy in 1990, Fugere's budget will rise 5% to 6% to cover associated IS labor costs and increased use of outside software companies.

Demand for IS Workers Is on the Rise

Respondents to this year's DATAMATION survey expect their departments to grow robustly, and they emphasize the increased importance of information technology (and by association, IS professionals) to

The IS Spending Cycle Should Continue

If user spending on information systems holds true to form, 1990 investments will be surpassed in 1991.



SOURCE: DATAMATION'S 1990 IS SPENDING SURVEY

Unless Smashed by Stronger Forces . . .

The years 1992–1999 could be affected in a positive way by turning over these wild card variables:

VARIABLES

■ Inflation/Interest Rates
In many companies, top IS executives and their budgets are now protected from changes in the inflation rate. As they prepare their budget, they are given a formula from the financial department that they must use to compute personnel and employment costs. This formula is preadjusted to take into account any variation in the inflation rate expected that year.

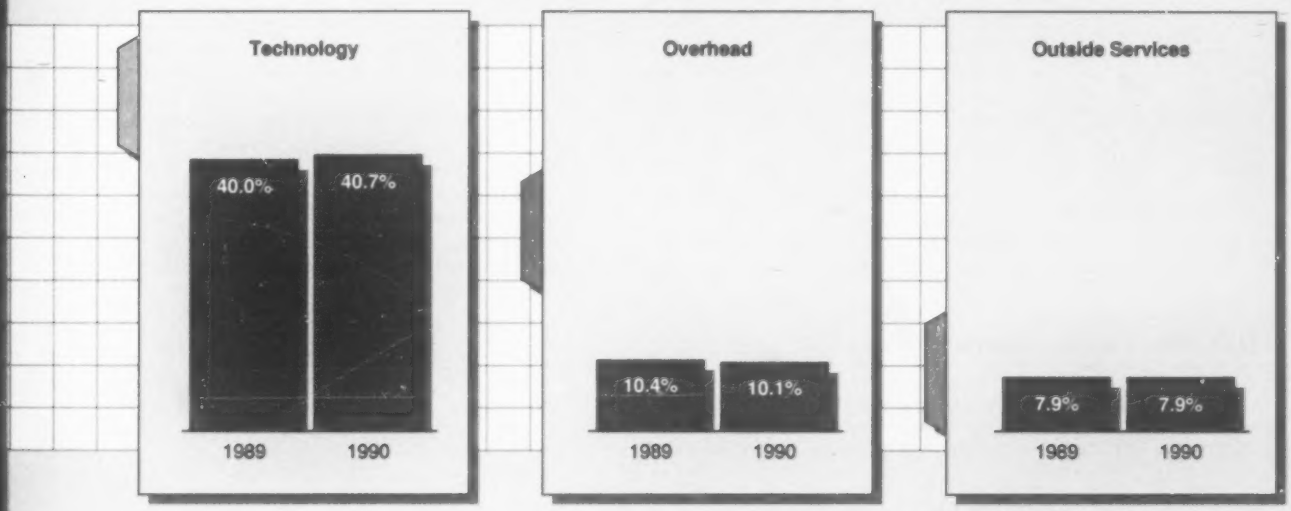
■ Changing Economics of Technology
Companies are today attempting to automate whole clusters of applications simultaneously as they build their networks, where once they focused on one application at a time in a sequential manner.

■ Interdependent Global Economies
It's well known that the Japanese and other nations have used long-term investment to gain market share. Many corporate chiefs aren't prepared to wait for such changes in the United States and believe that privatization of their companies is the best answer. Privately owned companies aren't answerable to public stock holders or the ruthless logic of the quarterly balance sheet and can lock into long-term IT investments.

SOURCE: DATAMATION'S 1990 IS SPENDING SURVEY

Where 1990 IS Spending Dollars Are Going

Traditionally, personnel, technology and overhead costs have been relatively fixed and predictable. The only real variable in this year's budget, and a small one at that, is the spending on outside services.



SOURCE: DATAMATION'S 1990 IS SPENDING SURVEY

their organizations. So like Fugere, their budgets will grow an average 5.9% in 1990 and, unlike those in last year's survey, they are hungry for IS workers. The size of the staff reporting directly to the average IS department (including contract staff from outside software companies) will increase by over 13% to 32 IS workers in 1990, the survey reveals.

A factor in the variable portion of the budget is software pricing. Although, for example, IBM's hardware pricing has been predictable, its software hikes have been erratic. Fugere says his department has often been unprepared for software price hikes. "We've been caught many times." says Fugere. The best you can do, he says, is discover whatever rhythm or pattern exists in IBM's software pricing and leave some slack in the budget for the years you think you'll get hit. Advice from one of IBM's biggest commercial customers, Aetna Life & Casualty Co. of Hartford, Conn., is more pointed. "Find ways to turn your IBM reps into employees of your company, not of Big Blue," says Irwin Sitkin, who recently retired as Aetna's vice president of corporate administration. "Get them to ferret out the data you need for budget planning."

Outside contractors will always remain a variable. "When clients demand more than you can deliver, you use them to get out of a bind," says Fugere. "When bust years come you cut them back."

But there are other outside variables that aren't so easy to control. Inflation, interest rates, the changing economics of technology and the increasing economic interdependence of nations across the world. Despite the existence of new stabilizing influences on IS budgets, such variables could break the cycle of three anytime during the rest of the decade. Sudden, unforeseen changes in, let's say, the Japanese banking or stock trading system could trigger a recession in the United States.

Perhaps the biggest variable is the impact on IS spending created by a change in thinking about how information technology should be deployed in organizations. By and large, users in the previous decade allocated IS resources in piecemeal fashion. They dealt with problems one application at a time in a sequential manner. In the new decade, users will attempt to automate whole clusters of applications simultaneously as they build their networks.

"To do so they must lock into long-term IT investments that may or may not result in big paybacks five years or more down the road," says Rod F. Monger, an

Or Unprotected by Stabilizing Forces

Many IS user organizations are creating buffers to guard against budget turbulence.

STABILIZERS

- Service Level Contracts
  Pacts between IS departments and the business units they support should minimize the possibility of information systems investments getting out of hand. IS now is everybody's budget.
- Accounting Changes.
  Don't be surprised to see the rule-making bodies in U.S. accounting make significant changes in policy in order to right the imbalance between U.S. and foreign companies.
- Privatization.
  If CEOs can find new sources of funding now that junk bonds are out, you'll see more and more publicly held companies taken private. That will enable them to invest in information technology for the long term—escaping those incessant quarterly phone calls of Wall Street analysts.

SOURCE: DATAMATION'S 1990 IS SPENDING SURVEY

analyst at the Research Board in New York City. Since the nation's accounting system doesn't encourage such long-term investment, here we have another unknown. Some corporate leaders and gurus from the accounting profession are already calling for reform of the U.S. accounting system. One idea is to do away with quarterly reporting and start with the yearly picture.

It's well known that the Japanese and other nations have used long-term investment to gain market share. Many corporate chiefs aren't prepared to wait for such changes and believe that privatization of their companies is the best answer. Privately owned companies aren't answerable to public stock holders or the ruthless logic of the quarterly balance sheet and can lock into long-term IS investments.

"Privatization is a growing trend," says Monger, who predicts that such a trend could bring about more long-term investment in information technology and have a major positive impact on IS budgets. Should there be a substantial overhaul in the U.S.

How the Competition Stacks Up

Personnel

If you feel like your organization is spending less than its rivals, here's a way to make your point. By comparing your IS budgets against industry averages, you should be able to measure just how competitive you are.

Manufacturing Industrial

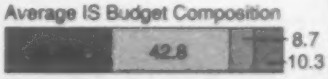
Average Annual Revenue per Company: $1.5 billion

Your Company's Annual Revenue: _____

Average IS Budget: $1.7 million

Your Company's IS Budget: _____

Average IS Budget Composition



Your Company's IS Budget Composition

Banks S&Ls

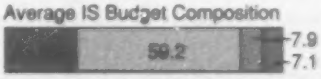
Average Annual Revenue per Company: $437.4 million

Your Company's Annual Revenue: _____

Average IS Budget: $1.0 million

Your Company's IS Budget: _____

Average IS Budget Composition



Your Company's IS Budget Composition

Insurance

Average Annual Revenue per Company: $1.6 billion

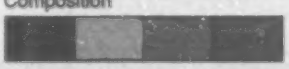
Your Company's Annual Revenue: _____

Average IS Budget: $2.5 million

Your Company's IS Budget: _____

Average IS Budget Composition

Your Company's IS Budget Composition



Retail Trade

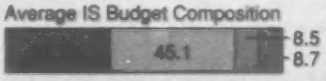
Average Annual Revenue per Company: $470 million

Your Company's Annual Revenue: _____

Average IS Budget: $1.4 million

Your Company's IS Budget: _____

Average IS Budget Composition



Your Company's IS Budget Composition

Wholesale Trade

Average Annual Revenue per Company: $48 million

Your Company's Annual Revenue: _____

Average IS Budget: $2.4 million

Your Company's IS Budget: _____

Average IS Budget Composition

Your Company's IS Budget Composition

Transportation

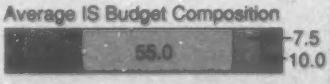
Average Annual Revenue per Company: $12.4 million

Your Company's Annual Revenue: _____

Average IS Budget: $4442.5 million

Your Company's IS Budget: _____

Average IS Budget Composition



Your Company's IS Budget Composition

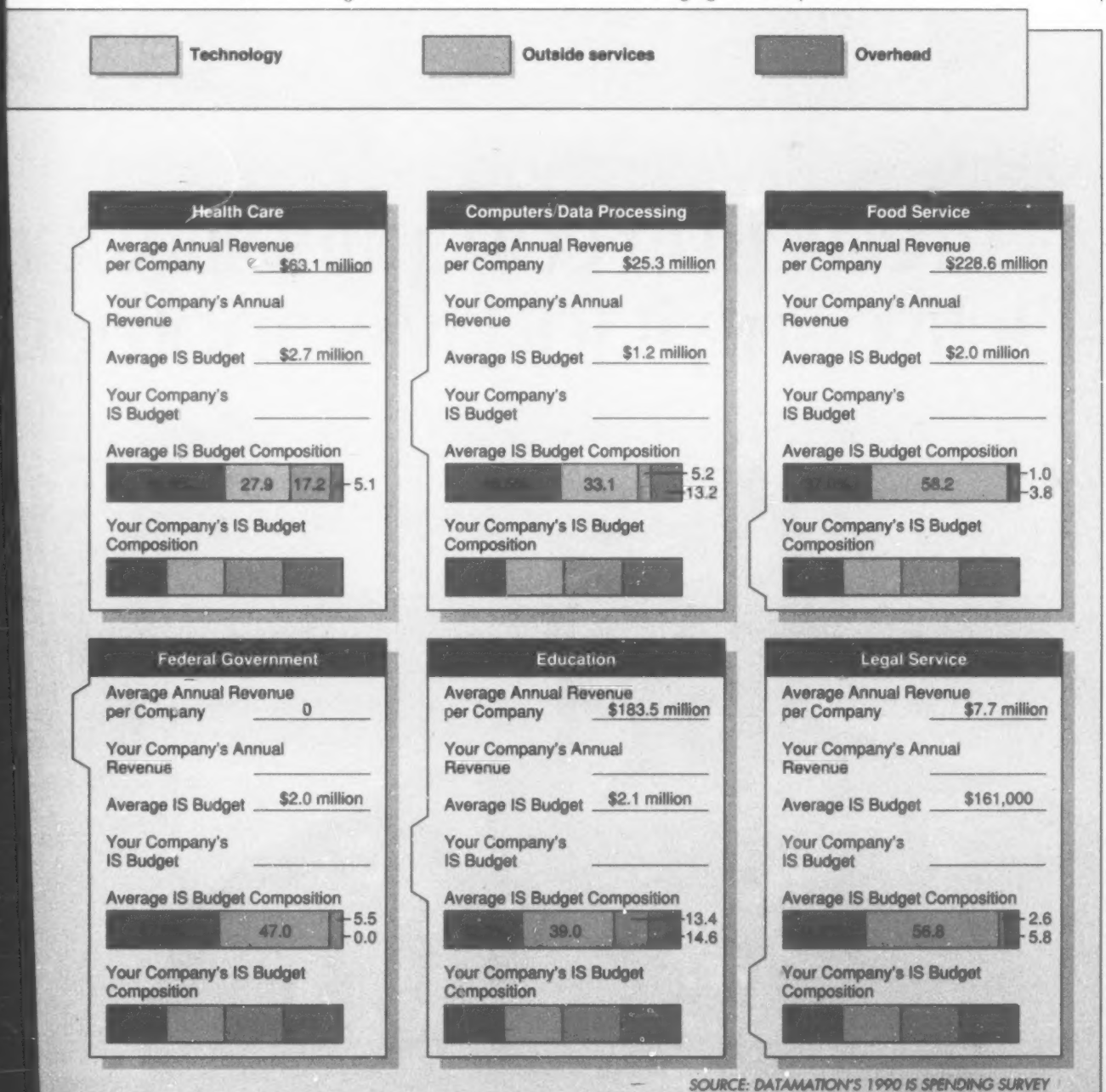
There have been no back-to-back boom years or consecutive years of slumping fortunes.

accounting system, and in the current structure of corporate ownership, IS budgets will be transformed. The thinking being that if U.S. companies have incentives to invest in the future, they will commit greater resources to information technology in the present.

Of more immediate concern to the cross section of CEOs, financial officers and top IS executives polled in this year's budget survey is another wild card: inflation. Coupled with rising interest rates, inflation could undermine IS budgets in 1990. The executives also say downsizing, a higher U.S. dollar and a diminishing pool of highly skilled IS personnel could curb budget growth.

As natural as it is to fear the unknown, it is possible that IS budgets in the 1990s could be buffered from such outside variables by an idea that has caught on in the 1980s: the service level agreement.

The 1970s and early 1980s brought wild swings in IS budgets, and spending could sometimes soar as much as 20% a year or more. "Five or six years ago, we were in double-digit growth," says DuPont vice



SOURCE: DATAMATION'S 1990 IS SPENDING SURVEY

In the new decade, users will attempt to automate whole clusters of applications simultaneously.

president of information systems Raymond E. Cairns of his company's past IS spending habits. Increases in IS outlays these days at the Wilmington, Del., chemicals giant barely match the growth of inflation as Cairns' department competes with other functions within DuPont for limited amounts of financial resources.

The reason IS budgets flew as fast as they once did and grounded to a near halt just recently has much to do with the customers of most IS departments—the functional areas of businesses that make them tick. "The business units didn't tell us exactly what they wanted, and they kept changing their requirements," Bethlehem Steel's Fugere replies when asked to account for those double-digit IS budget growth days of yore. "When costs escalated, IS became the fall guy," he says in explaining why budget growth trailed off.

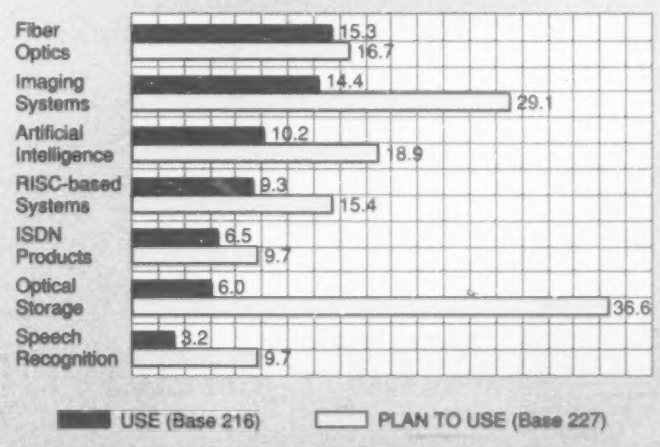
With the advent of service level agreements, that has all changed. Today, it is the business unit that must justify its portion of the IS budget, describe precisely what it wants done and be accountable for the money spent. The IS department signs a contract, a service level agreement, when it feels it can fulfill these requirements over the year ahead. The clients also sign the contract and become equally accountable for the work.

In many companies, top IS executives and their budgets are now also protected from changes in the inflation rate. As they prepare their budgets, they are given a formula from the financial department that they must use to compute personnel and employment costs. This formula is preadjusted to take into account any variation in the inflation rate expected that year.

Using service level agreements and inflation-buffering formulas, information systems and its clients can break up long-term IT investments into executable chunks. Emerging technologies, notably computer-aided software engineering (CASE), help by providing better measures of productivity and management of the ongoing software development process.

Emerging Technologies

Image-related products and services are capturing a lot of the IS dollars earmarked for nascent technologies. The chart shows the percentages of respondents who say they use or plan to use the following technologies.



Future Predictions

Only modest swings in IS budgets will occur in the 1990s, even with all the wild cards and uncertainties that characterize the outside environment, Fugere and other IS executives predict. A retreating economy, for example, won't even bring out everybody's budget axe. Some 52% of the IS and financial executives polled in this year's survey say that a recession in 1990 would have no impact on their budgets. Nearly two out of three executives, in fact, believe there will be no recession in 1990. Particularly adamant about this are the retail trade, insurance and process industry sectors.

Such antirecessionary feelings of course go hand-in-hand with a positive attitude toward revenue growth. Most U.S. executives think their businesses will grow heartily in 1990—expressing little or no fear that Pacific Rim or European rivals will best them. Moreover, it's apparent that they are counting on information technology to fuel such growth. Little else could explain why most users are planning significant increases in IS staffing—at a time when most other areas of corporations and agencies are under the chill of hiring freezes.

The IS Work Force Is Expanding

Respondents, typically from companies with 1990 revenues above $1 billion, are projecting a 13% increase in the number of staff reporting directly to the IS department. Demand is strongest in the manufacturing/industrial sector (a 19.2% increase) and least pronounced in the public sector (0.6% increase). But in none of the 27 industry categories on the survey was a decline in workers reporting to the IS department forecast.

Also growing strongly is "The New IS Force," a phrase coined in DATAMATION's August, 1, 1989 cover story (p. 18) on those full-time IS professionals who generally reside in business units. These dispersed workers constitute almost 34% of all IS professionals in the user organizations surveyed, and their numbers will grow 8.5% to an average 21.3 workers per company this year. Some organizations, of course, are employing this new force to greater degrees. At DuPont and MCI Communications Corp., for example, IS chiefs say that 75% of their organizations' IS work forces call business units—not headquarters—home.

In the minds of managers at large and small user organizations, the importance of information technology to their enterprises and the growth expected of the enterprises themselves are fueling demand for more IS workers. Curiously, another reason is corporate streamlining—particularly at companies with fewer than a thousand employees of all types. Almost six out of ten managers see streamlining as having a beneficial effect on their 1990 IS budgets—

Downsizing, a higher U.S. dollar and a diminishing pool of skilled IS workers could curb budget growth.

reinforcing the notion that information technology and its masters (IS workers) are enabling companies to trim away unnecessary fat.

Streamlining has an organizational connotation; it implies squeezing out inefficient layers of managers and workers. It shouldn't be confused with downsizing, which refers to switching from large computer systems to small ones. In fact, 61% of executives polled by DATAMATION regard downsizing as detrimental to budget growth.

Other reasons cited for the increase in the IS rank and file are the merger of voice and data operations (bringing communications employees under IS' umbrella), and the recentralization of the data center function within the organization.

Although the management over data center functions is returning to corporate headquarters at many user organizations, the processing power of IS continues to become more widely distributed throughout corporate domains, particularly at the PC level. It's clear from the survey that along with distributed computing has come distributed responsibility for information technology. This is perfectly natural when you consider that information technology typically consumes at least 30% of a company's capital spending budget.

Non-IS Influence

It's hardly surprising, then, that almost a third of all IS investments by user organizations surveyed by DATAMATION are made without any involvement from central IS influences. In addition, there are an increasing number non-IS employees with buying or specifying authority over information technology: an average 5.4 persons per company, an increase of 14% over last year.

Change is also evident in the way organizations are deploying these IS resources. In last year's survey, 49% of IS investments supported back-office applications. This year, it has declined to 38%, as mission-critical applications in manufacturing, distribution and sales/marketing have grown to consume the bulk of IS dollars.

Such front-office applications are built on desktop systems—but not necessarily on the single-user personal computers of yesterday. For the second year in a row, PCs are commanding a smaller—albeit still dominant—portion of technology investments than before. In 1990, PCs will capture only 34.6% of the budget for new hardware, software and communications products—down from 39.6% in 1989.

Instead, what's likely to support these new applications are small multiuser systems that can range from networked high-performance workstations and servers to the low end of midrange systems. Spending on multiuser systems, which usually run on second-generation PC operating systems like OS/2 or on UNIX, is expected to consume 11.4% of user resources for new technologies—a big jump from the 8% they devoured last year. These systems also may be small midrange systems, such as the low ends of IBM's AS/400 line and Digital Equipment Corp.'s VAX 6000 family, that serve the needs of a half dozen users, come bundled with database and operating systems and feature canned industry-specific software. Servers, such as Compaq Computer Corp.'s SystemPro, members of Sun Microsystems Inc.'s SPARC line and IBM's new RS/6000 family, also promise to capture multiuser dollars.

The public sector remains the biggest supporter of stand-alone PCs. Big orders for laptops and other systems will boost government spending on PCs by some 20% between 1989 and 1990, according to the survey. But small companies, especially those with up to 250 employees, are reducing their dependence on stand-alone PCs. And so are a growing number of industry sectors—particularly wholesale trade, food service, nondurable goods manufacturing and the process industries.

Minispending on Minis

The traditional minicomputer is also under siege. Medium and high-end midrange machines, those priced between $100,000 and $1 million, will attract merely 7.2% of the dollars that users spend on new hardware, software and communications. That's down from 7.4% a year ago. Not a big percentage as yet, but confirmation of the trend noted in the Cowen & Company/DATAMATION's Mini/Micro spending survey (See "The Desktop Dimension," DATAMATION, November. 1, 1989, p. 28), which revealed that the dollar value of minicomputer shipments would fall 10.5% between July 1989 and June 1990. That's the first such decline in the 16-year history of the survey.

Turning against the mini are banks, insurance companies, retailers, health care providers, educational institutions and, especially, process-manufacturers. Process industry spending on midrange systems will be down 37% this year. "It's hard to conceptually justify a midrange [system]," explains Norbert J. Connors, comptroller of computer services centers for the USS Steel Division of USX Corp.

Highlights of the 1990 IS Budget Survey

Some patterns clearly emerge in this year's spending outlook.

- The public sector is projecting a 7.2% increase in IS spending. The manufacturing/industrials sector expects an increase of 5.3% and the services sector, 5.2%. The average for the three, 5.9%, should outrun inflation which was 4.9% last year and is expected to exceed 5% in 1990.
- Some 63% of respondents say there will be no recession this year. A majority also state that even if there is a recession, it will have no impact on the IS budget.
- Demand for IS workers, both in the traditional IS department and in business units, is up appreciably over last year: 13.1% for the former and 8.5% for the latter.
- Stand-alone PCs are a diminishing percentage of total IS hardware revenue for the second year in a row. Favored instead are emerging small, multiuser systems.

SOURCE: DATAMATION'S 1990 IS SPENDING SURVEY

Streamling has an organizational connotation; it implies squeezing out inefficient managers and workers.

U.S. STEEL COMPTROLLER CONNORS says it's hard to justify spending on midrange systems.

in Pittsburgh. His company has junked all its minis and moved to a two-tier hardware architecture of large central hosts systems linked to dispersed multiuser systems.

But the mini has plenty of defenders, notably in the wholesale trade sector, which is throwing out stand-alone PCs and adding midrange systems. Another stalwart user of minis is the nondurable goods manufacturing industry. Companies in the 100 to 250 employees range will be the biggest buyers of minis in 1990, the survey reveals.

Big Iron Is a Big Target

Another hardware institution, the venerable mainframe system, is also under fire. IBM is coming to the end of a long eight-year mainframe cycle, and it shows in our survey. Large-scale systems spending will be off 20% as such MIPS monsters slip to represent merely .8% of all technology investments by users. This statistic may be a function of the survey sample, which draws from a cross section of companies—small, medium and large—in the United States. Many may not have large-scale systems installed in their organizations or at least not have widespread purchasing authority for them. Indeed, the DATAMATION 100 survey of the world's top information technology suppliers shows large-scale systems to be alive and well—accounting for 12.5% of worldwide industry revenues in 1988.

Mainframe spending has also been hit by industry consolidation. Untold numbers of data centers have been shut down in recent years, only to be replaced by fewer megasized complexes. "There's too much fat in the DP budget," says Mike Zucchini, chief information officer at the Fleet Navistar Financial Group in Providence, R.I. "And most of it is in the form of dispersed mainframe-based data centers."

The mainframe sniping in the United States may be a temporary phenomenon, some experts believe. The first of IBM's large systems family for the 1990s, "Summit," should ship late next year. Customers are expected to open their coffers for Summit to be able to mount new databases and business critical applications such as imaging and computer-integrated manufacturing.

The survey shows a healthy appetite remains for large system memory, disk and tape storage after consolidation. For example, the percentage of the IS budgets in 1990 allocated for disk/tape subsystems at companies with more than 1,000 employees is expected to grow 42%—even with far fewer new mainframes around.

On Software & Outsourcing

Although each hardware category has its champions and its detractors, the survey population agrees that software rightfully occupies center stage. Demand for systems software is up, while investments in applications software are down. What explains such behavior in a decade when users say they are devoted to applying information technology to every corner of their enterprise? Perhaps users are investing in new systems software, notably products such as OS/2 and UNIX, in anticipation of new applications they intend to build with future IS budgets.

Supporting this line of thinking is the outlook for spending on database software. Since so many applications are built on databases, many people put database software in the same category as systems software. Nearly 3% of all IS investments in new technologies will go toward database software. Measured as a portion of the average user organization's total outlays for software of all types, database products consume nearly 16% of such spending.

The budget survey always throws light on some controversial subjects, and this year is no exception. Outsourcing, the farming out of IS work to software companies and other vendors, is a continuing trend. Although some fear it will eventually undermine the whole IS profession, our survey doesn't support such a view. IS spending on outside services only amounts to 7.9% of the total. There is some cause for concern, however, at large organizations—those with 1,000 or more employees—where it's a different story. At such companies, the percentage of outsourced money is growing much faster—18% from 1989 to 1990.

The survey also reveals that CASE, imaging and RISC technologies are taking off. Especially notable is the increased investment in optical storage products. Although only 6% of survey respondents currently use this technology, nearly 37% plan to do so by the end of the year.

Such a willingness to spend on emerging technologies always has characterized the budget habits of IS users. If 1991 holds true to form, new products and services and all the other boats in the IS ocean will benefit from a rising—perhaps cresting—tide next year. This year's survey certainly suggests that smart user organizations are bringing the right IS hands on deck to see that such investments speed them on their competitive courses. ▭

Photograph by Scott Goldsmith/Black Star

Experts at Retail

Expert systems technology once failed to attract widespread IS attention because of missing links to existing systems. With the connections now falling into place, practically any business can apply AI—even retail cookie stores.

BY HARVEY P. NEWQUIST III

Over the past decade, the business of artificial intelligence (AI) has been the computer industry's equivalent of Madonna: flashy and sensuous with a hint of mystery, but perhaps lacking in substance. While fans of the technology applauded its inherent potential, critics derided it as being vapid and overhyped.

But AI, most notably in the area of expert systems, is beginning to force its way into places one normally wouldn't expect to find it. As a result, it is commanding some respect and praise for its effect on corporate bottom lines in company environments ranging from United Airlines Inc.'s passenger gates to the trading floor of the Chicago Board of Trade.

Perhaps the significance of this ongoing advance of AI is best seen by its recent foray into the retail sector. The 1990s is already heralding a substantial increase in the number of AI systems deployed, as well as the number of organizations beginning to integrate AI into their overall IS strategy.

Integration Is Key

Part of the problem historically with expert systems and other forms of AI were the promises of human-level performance in tasks that required expertise, logic and experiential knowledge. These promises, however, failed to include such "minor" features as the ability to integrate into existing systems, portability over different architectures within an organization, compatibility with installed software and price/performance benefits. At least that's the way the original AI pioneers approached these IS essentials. Needless to say, users didn't exactly trample over themselves in the rush to buy AI software.

Beginning in 1988, user demand for standard systems characteristics became vehement enough that AI vendors almost universally began offering features that had been missing for most of the decade. This demand was driven mostly by engineers forced to work with "real world" systems already installed at large manufacturing companies in the automotive and aerospace industries.

Today, widespread use and integration of expert systems technology has become a fact of life. No longer confined to those areas that have traditionally been attracted to AI—notably the manufacturing and financial services industries—expert systems can be found in law enforcement, marketing, personnel management and a host of other nontraditional computer use sectors.

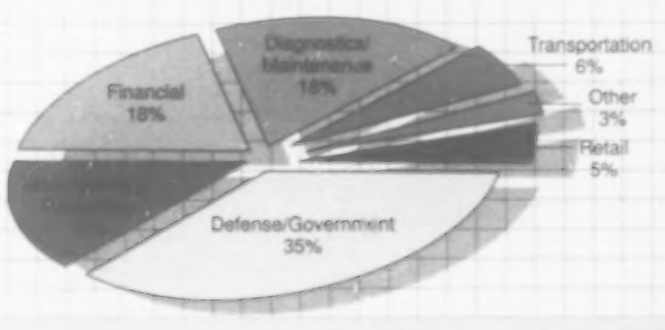
Retailer are perhaps the most interesting of the latest expert system subscribers. That's because few competitive business environments are so dramatically affected by subjective consumer whims. Everything from a store's location to the color of its floor tile can have an impact on retail sales. Something as seemingly insignificant as changing the piped-in music from Metallica to the more laid back Billy Joel can improve a store's floor traffic and sales potential. Therefore, expertise and an acute sense of market demands are essential to successful retailing.

Packaging that expertise into an expert system can provide inexperienced or poorly performing managers with top-level decision-making and planning. To drive the point home, this article examines several applications that were developed using tools from what many in the AI community might consider an unlikely source: IBM. Most expert systems are developed using tools from a variety of AI-specific software companies, but IBM's own offerings in this arena are growing in popularity. One of IBM's most recent contributions is a complete AI development environment called The Integrated Reasoning Shell or TIRS.

The success of AI in retailing, and IBM's role in developing expert systems, serve to illustrate that AI success stories are no longer limited to cold, dark corners of engineering and research labs. Nor are they managed by individuals who only speak of AI in terms like "sideways fuzzy logic chaining" and "backward propa gation of constrained inference parameters." Rather, AI and expert

Look Who's Shopping for Expert Systems

Practically invisible a year ago, expert systems for retailing now command 5% of the total market.



Source: The Relayter Group

systems are here to stay.

Best known as the purveyor of choice chocolate chip cookies, Mrs. Fields Inc. of Park City, Utah, is also a preeminent user of expert systems technology. The company uses AI to assist in almost every area of its retail operations, and it has been so successful in applying AI that it now markets its own expert systems software through a subsidiary, Fields Software Group, also in Park City.

Since its founding in 1977, Mrs. Fields has attempted to use computers to handle most paper-pushing tasks and basic operations management. This was largely due to the fact that founder and chief operating officer Debbi Fields' husband, Randy, had worked for years as an IBM systems programmer.

Initially, Randy's fundamental belief in computers allowed the Fields to handle basic data management tasks such as sales and inventory control. As the company grew, this IS base provided the infrastructure for corporatewide e-mail networks and more sophisticated transaction processing. This is especially important for a company that has grown to include more than 700 cookie outlets, 100 La Petite Boulangerie pastry and delicatessen stores and dozens of Fox Photo stands.

Chips Off the Old Block

But more important to the Fields than simply monitoring basic business functions of stores was the preservation of what made the original stores successful in the first place—Debbi Fields' personal marketing techniques.

On slow days at her first store in Palo Alto, Debbi would offer free cookies to passers-by outside the store. She would first bake a day's worth of inventory based on past experience and then would set sales goals for herself each day. But as her business grew into hundreds of U.S. stores, Debbi Fields could no longer practice her cookie marketing expertise in each store.

□ Users Didn't Exactly Trample Over Themselves To Buy AI Software.

The Fields decided to go the next best route: to try to capture her experience in expert systems that every store could access at any time. Thus was born the company's Retail Operations Intelligence systems (ROI).

Beginning on an IBM mainframe using Big Blue's Expert System Environment (ESE) software, the company set out to provide its store managers with software that could deliver accurate analyses of business conditions, as well as address most business predicaments or personnel situations that might arise. From the development of basic retail systems came a host of integrated software modules that today form the core of Mrs. Fields ROI software: Sales Reporting & Analysis, Daily Sales Capture, Labor Scheduler, Daily Production Planner, Interviewing, Skill Testing, Time Collection and Inventory. All of these components runs on a PC linked into IBM AS/400 or System 38 minicomputers installed in Mrs. Fields' Utah headquarters. The minis are used for nationwide data collection and communicate with the PCs using toll-free dial-up lines.

The modules are designed to work together, but each has its own specific area of retailing expertise. For instance, the Labor Scheduler takes full advantage of Mrs. Fields' headquarters executives who have had years of employee management experience in areas like employing minimum-wage personnel, the predominant counter help at most cookie stores. The LS module schedules employees based on knowledge of labor and work force-related conditions, including the labor laws of a particular state, employee work preferences and store characteristics. Using knowledge-processing techniques, it draws up a work schedule, including breaks, to optimize hourly employees' time. A store manager can therefore minimize overtime and provide workers with a potentially more flexible schedule.

Because many retail employees tend to stay with any particular job longer for less than a year, interviewing prospective employees is an ongoing task at every store. The Interviewing module of ROI is designed to help store managers assess the potential of prospective store personnel. It also provides a way to make sure that each employee is asked the same set of questions, a process that helps separate the potential malcontents from future employees of the month.

For the ultimate day-to-day retail operation, there is the Daily Production Planner, an expert system that serves as an intelligent and interactive appointment book, diary and to-do list bundled into one. All store managers log into this application about 30 minutes before the stores open and enter specific information about the day. In the case of a potentially high-traffic day for cookie sales—say Valentine's Day—the system will check traffic through the store in past years on that date and will also factor in such things as weather conditions.

The Planner creates a full day projection of the amount of dough that must be prepared. It continues this process on an hourly basis to chart actual store traffic and progress and may make decisions on cutting back production or even offering free samples to passing customers to increase sales. All of this is designed to place the emphasis on food retailing where it counts—maximizing profit potential but minimizing leftovers and loss. At the end of a day, a Mrs. Fields store

Mrs. Fields Software Spinoff

Based in Park City, Utah, The Fields Software Group is a division of cookie queen Mrs. Fields Inc. that sells retail management software based on expert systems technology. Although Mrs. Fields may seem an unlikely source for artificial intelligence software, the company's success with its homegrown expert systems encouraged executives to offer the modules to other retailers through its own software sales company. In this way, Mrs. Fields has not only capitalized on its own expertise in house but now makes money selling that expertise to others.

The Fields Software Group's packages are sold in modules for PC-based systems. Each module, or Retail Operations Intelligence system (ROI) is designed to deliver expert advice on specific areas of interest to retailers, including daily sales, labor scheduling and personnel management.

While some companies are reluctant to disclose their developments in AI because of the strategic advantage that expert systems deliver, Mrs. Fields has no such qualms with its ROIs. Although the ROI prepackages much of the information required to create a custom expert system, each module still has to be tailored to a specific buyer's needs. As a result, an ROI-based system for the cookie business can wind up looking quite different than one applied in an auto parts store. The modules can be purchased for approximately $500 to $1,000 apiece, with the entire ROI system retailing for $8,000.

manager can measure performance against projections and then use all of those data again next year to help boost sales.

Retailing, California Style

The Broadway, a subsidiary of Carter Hawley Hale Stores Inc. (CHH), is a Los Angeles-based chain of 43 department stores performing some 57 million customer transactions a year in what can easily be considered the most fiercely competitive retail and fashion market in America: Southern California.

In a land where conspicuous consumption is a way of life, customer service and highly qualified retail managers help to determine success or failure of a retail operation. And for the department store business, which has seen a recent spate of bankruptcies and a For Sale sign hung on Bloomingdale's, every consumer dollar won at the expense of competitors can mean the difference between ongoing White Sales or a Going Out of Business sale.

At The Broadway, the everyday management of each store is handled by area sales managers (ASMs), many of whom are recent college graduates with only a few years of actual retail experience. The 645 ASMs employed by the company are expected to competently manage store salespeople; analyze sales reports; deal with customers; and plan six-month retail strategies based on market trends, fashions and fads.

More Than a Fashion Statement

Human nature being what it is, some managers were performing better than others. In an attempt to create consistency, senior executives at both The Broadway and parent Carter Hawley Hale, notably Information Services chief Vince Conant and Broadway president Richard Clayton, began exploring knowledge-based systems as a potential avenue for increasing managers' performance.

The Broadway had been fully automated for some time, relying on a variety of IBM architectures for interactive gift registries, credit processing and sales transactions. In the end, Broadway selected IBM's ESE tool for mainframe development.

To begin building the knowledge base, eight of the top-producing area sales managers were recruited to provide the heuristics (rules of thumb) for a system that would become known as the Area Sales Manager Expert System Consultant. Based on ongoing interviews and knowledge-gathering sessions with these ASMs, The Broadway's internal systems developers came up with six modules addressing critical areas of ASM job performance: sales techniques, staffing, product knowledge, product procurement, floor layout and motivation.

WHEN MRS. FIELDS INC. grew too big for the founder to influence each store's marketing methods, the company cloned Debbi Fields' expertise in an expert system.

Initial development of the system took nine weeks, which is a far cry from the standard 18 to 36 months required for AI prototyping in the early 1980s. What's more, fewer than five programmers were working on the project at any one time, and all of them already belonged to the IS department.

The system was beta tested in two Southern California Broadways during the spring of 1988. Early ASM users were given a training course in the system and then given access to use it on their own. When sales figures for the stores showed a marked uptick, The Broadway's management decided to deploy the expert system in every location. This process took about a year, and now every Broadway store is on line with the ASM Expert System Consultant running on IBM mainframes under MVS/TSO. There is talk within the company of delivering the system on PCs and even installing it in every one of CHH's 114 stores nationwide.

□ AI SUCCESS STORIES ARE NO LONGER LIMITED TO COLD, DARK CORNERS OF RESEARCH LABS.

As a user works his or her way through each of the modules, the system asks for store-specific data such as average sales per hour and current sales as compared with last year's sales. It then pinpoints areas of concern, as well as strong management strategies and characteristics.

Many of The Broadway's ASMs find that the immediacy of strategy analysis based on current sales figures and general store performance helps them to make critical decisions much more quickly—something that can be very important in day-to-day retailing. The company is now working on other expert systems, including a staple stock adviser, which helps to control the inventory and ordering processes of the 1.5 million different stock items that The Broadway carries.

As all retailers begin to automate and then add intelligence to their computer operations, certain companies are going to have the benefit of utilizing these tools over longer periods of time, establishing themselves as masters of data analysis and manipulation, as well as initiators of strong competitive strategies. It is conceivable that expert systems might even work their way to the point of purchase level, where retail systems help buyers decide which clothes or meals to buy.

Bringing Intelligence to Colleges

Zenith is in the process of putting just such a system into college bookstores to help students determine the types of software and hardware that will meet the needs of their course curricula and pocketbooks. Just as shopping malls currently feature computerized directories, individual stores may someday soon offer touch screen expert systems that entice customers to buy those items that come closest to meeting their special requirements. And for some people—especially those fashion victims who choose to wear plaid pants and striped shirts—retail expert systems like this could also be doing a community service. □

Harvey P. Newquist III is chief executive officer of The Relayer Group in Scottsdale, Ariz., which publishes the AI Trends Newsletter *on the business of artificial intelligence.*

Diversity at the Low End

Despite all the differences between their various countries and cultures, European IS users share common attitudes that are shaping the structure of the PC and workstation market.

BY MARTIN HEALEY

In Europe, diversity dominates and divides the various countries and cultures. That same diversity is also discernible at the low end of the information systems spectrum, where there exists a wide range of market conditions and application needs. However, cutting through this diversity are common attitudes toward technology and its associated risks and rewards.

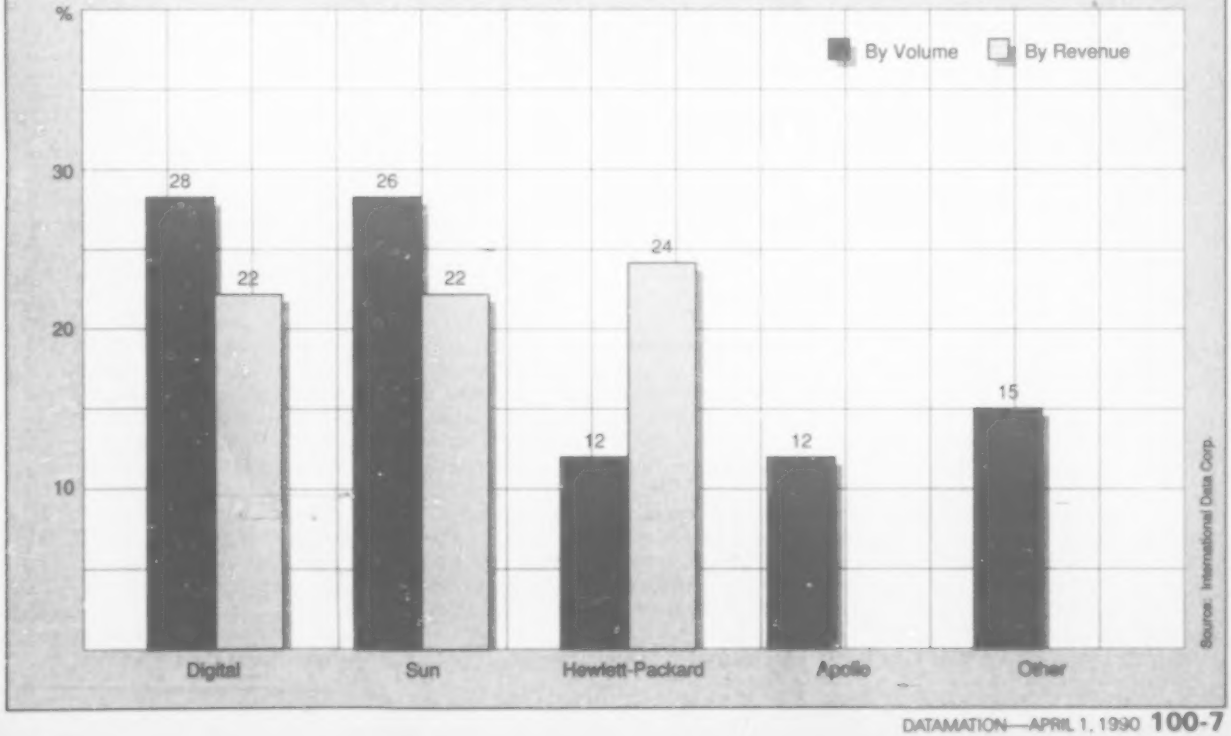
Overall, the European market for PCs and workstations is reasonably buoyant, with user interest picking up in both the private and public sectors. Yet, despite some nationalistic tendencies toward homegrown wares—particularly in France and West Germany—most of the PC and workstations being purchased in Europe today are of foreign vintage.

To fully understand the market, you must understand the mentality at work in Europe. While Europe is made up of discrete countries at various stages of IS implementation, these countries share many of the same attitudes regarding PCs and workstations.

Right now, most European users are saddled with DOS systems, and the software problems associated with these PCs are beginning to surface. At the same time, users are currently reluctant to bring in new machines, choosing instead to maximize their current investments.

European Workstations Shipped in 1988

Hewlett-Packard continues to pull in the most revenues, despite Digital's edge in volume.



Aware of these problems, European users are demanding more from their current PC products.

This conservative trend, which is much more prevalent in Europe than in the United States, should slow the pace of European PC purchasing. This naturally runs counter to optimistic predictions that the European PC market will continue to grow at a healthy clip well beyond 1993, when many of Europe's economic borders will come down.

What will burgeon is the number of PCs connected to local area networks, however. Consequently, the revenue from LANs should actually grow more than the revenue from PCs. The demand for high-end network servers in Europe should also increase as more PC users connect their machines directly to LANs.

Multiuser Systems Turning to Unix

The most significant expansion in the PC market is expected to come from multiuser machines targeted at the lower end of various vendors' minicomputer lines. Multiuser systems based on PCs will inevitably turn to UNIX. What that means for the future of office workstations is still not certain, since the battle will be raging for some time to come over whether UNIX or IBM's OS/2 operating system will dominate desktops in Europe and the United States. Nevertheless, it is reasonable to speculate that OS/2 will be the choice of European companies in the private sector, which persist in clinging to proprietary products.

But the move to OS/2 promises to be a slow march because the operating system is still immature and the cost of the hardware remains prohibitive. As a result, OS/2 is not expected to become a major force in the European office workstation market before 1992.

□ MULTIUSER SYSTEMS BASED ON PCS WILL INEVITABLY TURN TO UNIX.

In the public sector, meanwhile, UNIX will be favored. Influenced by political decisions and supported by the national Post, Telephone & Telegraph (PTT) authorities, European governments are making strong commitments to both UNIX and the International Standards Organization's Open Systems Interconnection (OSI) model. And, indeed, many public organizations in Europe are already specifying UNIX as the mandatory operating system.

Purchasing PCs in Europe

In Europe, middlemen are the name of the game when it comes to peddling and purchasing PCs. While mail-order marketing is used to move some machines, most are sold through a supplier/distributor/dealer hierarchy.

In the commodity corner of the market, price reigns supreme. However, things get more confusing on the business-computing front, where the systems spectrum ranges from simple PCs all the way up to multiuser 386 machines that are gradually muscling their way into minicomputer turf.

The confusion in this segment stems from the fact that typical PC dealers in Europe usually don't have the basic skills needed to sell the more sophisticated business-computing products. And the minicomputer dealers and agents who have those prerequisite skills don't want to sell these lower end wares because they're still wedded to traditional minis of the IBM System/36 breed.

Influencing every PC product segment are Europe's corporate users, who often have special arrangements with dealers for machines. Many of these private sector users have set their own rules about PC purchasing and have their preferred products. Many are moving to connect their PCs into local area networks with mainframe terminal emulation. Currently plugged into PC/DOS or Apple Computer Mac machines, this Continental corporate contingent is the camp IBM must woo to ensure the future success of OS/2 in Europe.

With the big push by the European public sector for standards, UNIX and OSI promise to spark sales of multiuser PCs and possibly even office workstations. Still, the bulk of the office workstation business in Europe will come from private sector firms because the cost per user—running roughly at $7,000 for a 7-megabyte PS/2 model 70—is far too high for public sector organizations. As a result of these cost considerations, PC/DOS machines, warts and all, will continue to remain strongly present in the public sector for the foreseeable future. And both sectors are contributing to the growth of PC/DOS-based LANs.

Similarly, with the exception of a few application areas such as geophysical research, European governments have not been heavy users of engineering workstations. The dominant users of engineering workstations in Europe have been in the private sector, where shipments have soared over the past few years.

Vendors With Appetites

In 1988, shipments of engineering workstations in Europe skyrocketed 82% to 66,000 units, according to International Data Corp. of Framingham, Mass. The current installed base in Western Europe of 2,148,000 engineering workstations is expected to continue to expand before leveling off in 1994. The real growth in the market promises to come from reduced instruction set computing (RISC) machines—growth that could hold big payoffs for the current market leaders, IBM and Silicon Graphics Computer Systems Inc.

There are no noteworthy European engineering workstations. As in the rest of the world, U.S. vendors Apollo Computer Inc., Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems Inc. share stakes in the engineering workstation market in Europe. HP, however, is still the biggest shareholder in that market, which will continue to be dominated by U.S. suppliers.

□ RIGHT NOW, MOST EUROPEAN USERS ARE SADDLED WITH DOS SYSTEMS.

European vendors, hungry for a slice of this juicy segment, are expected to link up with other foreign suppliers, marketing the resulting workstation wares under their own labels. Many of these deals will be with smaller companies that produce less popular RISC machines. Such collaborations could wind up giving front-runners IBM and Silicon Graphics a real run for their money in Europe.

This link-and-label approach is all too familiar to European vendors, most of which have dropped the ball at the low end and filled in their PC product gap with machines manufactured in the Far East and sold under their own proprietary names. Most are IBM-compatible machines that are chiefly sold through dealer networks. ▭

Martin Healey is chairman of the board of Technology Concepts Ltd. in Cumbran, South Wales.

DATAMATION/PRICE WATERHOUSE QUARTERLY REPORT

Meeting Project Deadlines Is the Top Priority

IS executives are most worried about meeting time schedules and performance guarantees for key systems projects. Costs, meanwhile, seem to be under control.

BY NORM STATLAND

Cost containment no longer ranks among the chief concerns facing information systems executives, a signal that user organizations have their IS expenses under greater control than at any other time in recent years.

Instead, IS execs polled by DATAMATION and Price Waterhouse are wringing their hands over project deadlines, new technology management, maintenance and voice/data integration.

In voicing such concerns, IS executives are saying that:

- Computer-aided software engineering tools and systems development methodologies haven't made significant inroads into the problem of delivering systems development projects on time.
- Suppliers of new information technology and industry experts/consultants must do a better job helping users predict what impact new developments will have on their organization's key processes, and they must do that with enough lead time to allow users to deal effectively with the new technologies.
- Requests from end users and business unit managers to enhance existing applications and build new ones are stretching the limits of IS executives' ability to maintain systems. The reasons for the delays are tied into the architecture of most systems that were created in the 1970s and early 1980s. These were fragmented rather than integrated designs, developed without the driving factor of a data model.
- The integration of communications and information processing is a necessity as more and more organizations begin to rely on networks to knit together far-flung business-processing activities. The need is most pressing in large organizations, ones employing 500 or more workers. More than half plan to let end users increase spending on distributed computing, which usually entails substantial outlays for local area networks.

One reason, perhaps, that so many IS executives are focusing on these problems instead of on budget issues is that a number of them have put the brakes on spending. Our poll indicates that as many as three out of five users will hold the line in all areas of spending and staff increases for the immediate future.

The shift away from cost concerns to more pressing needs like integration reflects, perhaps, a growing awareness of the importance of strategic systems planning. Properly drawn plans should strive to provide for a database or databases that can be shared throughout an enterprise—a feat that will require more attention to data-driven designs.

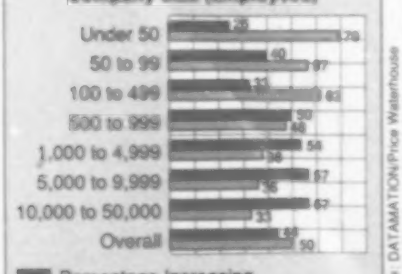
Building systems driven by a data model will enable IS executives to create far more flexible systems than they could otherwise. And flexibility, as we all know, will be a hallmark of the successful corporation of the 1990s. ▭

Norm Statland is national director of Price Waterhouse's Information Technology practice.

Distributed Computing Outlays Are Up at Large Companies...

Although most IS execs are holding the line on spending, they aren't sparing dollars that end users can spend on PCs and networks.

USER-CONTROLLED SPENDING IN THE NEXT 12 MONTHS
Company Size (employees)

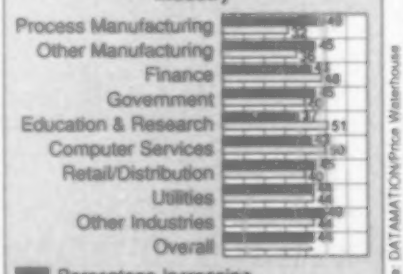


Source: DATAMATION/Price Waterhouse

While Hardware Investments Are Even...

The number of IS execs who are buying more CPUs is nearly the same as those who are content with their current systems.

HARDWARE SPENDING IN THE NEXT 12 MONTHS
Industry

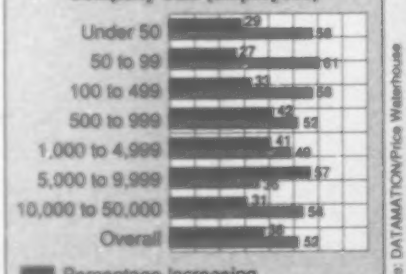


Source: DATAMATION/Price Waterhouse

And Software Spending Dips

Barely one out of three IS execs is plunking down more money for software.

SYSTEM SOFTWARE SPENDING IN THE NEXT 12 MONTHS
Company Size (employees)



Source: DATAMATION/Price Waterhouse